shall account for the effects of ship motion and flexure, including weight, yaw, sway, roll, pitch, heave, and vibration.

(d) *Ratings for pressure and temperature (modifies 102.2).* The material in 102.2 of ASME B31.1 applies, with the following exceptions:

(1) The details of components not having specific ratings as described in 102.2.2 of ASME B31.1 must be furnished to the Marine Safety Center for approval.

(1) The details of components not having specific ratings as described in 102.2.2 of ANSI B31.1 must be furnished to the Marine Safety Center for approval.

(2) Boiler blowoff piping must be designed in accordance with § 56.50–40 of this part.

(e) *Pressure design (modifies 102.3, 104.1.2, and 104.4).* (1) Materials for use in piping must be selected as described in § 56.60–1(a) of this part. Tabulated values of allowable stress for these materials must be measured as indicated in 102.3.1 of ASME B31.1 and in tables 56.60–1 and 56.60–2(a) of this part.

(2) Allowable stress values, as found in the ASME Code, which are restricted in application by footnote or are italicized shall not be used. Where multiple stresses are listed for a material, the lowest value of the listing shall be used unless otherwise approved by the Commandant. In all cases the temperature is understood to be the actual temperature of the component.

(3) Where the operator desires to use a material not listed, permission must be obtained from the Commandant. Requirements for testing found in § 56.97–40(a)(2) and § 56.97–40(a)(4) may affect design and should be considered. Special design limitations may be found for specific systems. Refer to subpart 56.50 for specific requirements.

(f) *Intersections (modifies 104.3).* The material in 104.3 of ASME B31.1 is applicable with the following additions:

(1) Reinforcement calculations where applicable shall be submitted.

(2) Wherever possible the longitudinal joint of a welded pipe should not be pierced.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970; 37 FR 16803, Aug. 19, 1972; CGD 73–254, 40 FR 40164, Sept. 2, 1975; CGD 77–140, 54 FR 40602, Oct. 2, 1989; CGD 95–012, 60 FR 48050, Sept. 18, 1995; CGD 95–028 62 FR 51200, Sept. 30, 1997; USCG–1998–4442, 63 FR 52190, Sept. 30, 1998; USCG–2003–16630, 73 FR 65175, Oct. 31, 2008]

Subpart 56.10—Components

§ 56.10–1 Selection and limitations of piping components (replaces 105 through 108).

(a) Pipe, tubing, pipe joining fittings, and piping system components, shall meet material and standard requirements of subpart 56.60 and shall meet the certification requirements of part 50 of this subchapter.

(b) The requirements in this subpart and in subparts 56.15 through 56.25 must be met instead of those in 105 through 108 in ASME B31.1 (incorporated by reference; see 46 CFR 56.01–2); however, certain requirements are marked ''reproduced.''

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970; USCG–2003–16630, 73 FR 65175, Oct. 31, 2008]

§ 56.10–5 Pipe.

(a) *General.* Pipe and tubing shall be selected as described in table 56.60–1(a).

(b) *Ferrous pipe.* ASTM Specification A 53 (incorporated by reference, see § 56.01–2) furnace welded pipe shall not be used for combustible or flammable liquids within machinery spaces. (See §§ 30.10–15 and 30.10–22 of this chapter.)

(c) *Nonferrous pipe.* (See also § 56.60–20.) (1) Copper and brass pipe for water and steam service may be used for design pressures up to 250 pounds per square inch and for design temperatures to 406 °F.

(2) Copper and brass pipe for air may be used in accordance with the allowable stresses found from table 56.60–1(a).

(3) Copper-nickel alloys may be used for water and steam service within the design limits of stress and temperature

indicated in ASME B31.1 (incorporated by reference; see 46 CFR 56.01–2).

(4) Copper tubing may be used for dead-end instrument service up to 1,000 pounds per square inch.

(5) Copper, brass, or aluminum pipe or tube shall not be used for flammable fluids except where specifically permitted by this part.

(6) Aluminum-alloy pipe or tube along with similar junction equipment may be used within the limitation stated in 124.7 of ASME B31.1 and paragraph (c)(5) of this section.

(d) *Nonmetallic pipe.* Plastic pipe may be used subject to the conditions described in § 56.60–25.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970; CGFR 72–59R, 37 FR 6189, Mar. 25, 1972; CGD 77–140, 54 FR 40602, Oct. 2, 1989; CGD 95–028, 62 FR 51200, Sept. 30, 1997; USCG–2000–7790, 65 FR 58460, Sept. 29, 2000; USCG–2003–16630, 73 FR 65175, Oct. 31, 2008]

Subpart 56.15—Fittings

SOURCE: CGD 77–140, 54 FR 40602, Oct. 2, 1989, unless otherwise noted.

§ 56.15–1 Pipe joining fittings.

(a) Pipe joining fittings certified in accordance with subpart 50.25 of this subchapter are acceptable for use in piping systems.

(b) Threaded, flanged, socket-welding, buttwelding, and socket-brazing pipe joining fittings, made in accordance with the applicable standards in tables 56.60–1(a) and 56.60–1(b) of this part and of materials complying with subpart 56.60 of this part, may be used in piping systems within the material, size, pressure, and temperature limitations of those standards and within any further limitations specified in this subchapter. Fittings must be designed for the maximum pressure to which they may be subjected, but in no case less than 50 pounds per square inch gage.

(c) Pipe joining fittings not accepted for use in piping systems in accordance with paragraph (b) of this section must meet the following:

(1) All pressure-containing materials must be accepted in accordance with § 56.60–1 of this part.

(2) Fittings must be designed so that the maximum allowable working pressure does not exceed one-fourth of the burst pressure or produce a primary stress greater than one-fourth of the ultimate tensile strength of the material for Class II systems and for all Class I, I-L, and II-L systems receiving ship motion dynamic analysis and nondestructive examination. For Class I, I-L, or II-L systems not receiving ship motion dynamic analysis and nondestructive examination under § 56.07–10(c) of this part, the maximum allowable working pressure must not exceed one-fifth of the burst pressure or produce a primary stress greater than one-fifth of the ultimate tensile strength of the material. The maximum allowable working pressure may be determined by—

(i) Calculations comparable to those of ASME B31.1 (incorporated by reference; see 46 CFR 56.01–2) or section VIII of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 56.01–2);

(ii) Subjecting a representative model to a proof test or experimental stress analysis described in paragraph A–22 of section I of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 56.01–2); or

(iii) Other means specifically accepted by the Marine Safety Center.

(3) Fittings must be tested in accordance with § 56.97–5 of this part.

(4) If welded, fittings must be welded in accordance with subpart 56.70 of this part and part 57 of this chapter or by other processes specifically approved by the Marine Safety Center. In addition, for fittings to be accepted for use in piping systems in accordance with this paragraph, the following requirements must be met:

(i) For fittings sized three inches and below—

(A) The longitudinal joints must be fabricated by either gas or arc welding;

(B) One fitting of each size from each lot of 100 or fraction thereof must be flattened cold until the opposite walls meet without the weld developing any cracks;

(C) One fitting of each size from each lot of 100 or fraction thereof must be hydrostatically tested to the pressure required for a seamless drawn pipe of